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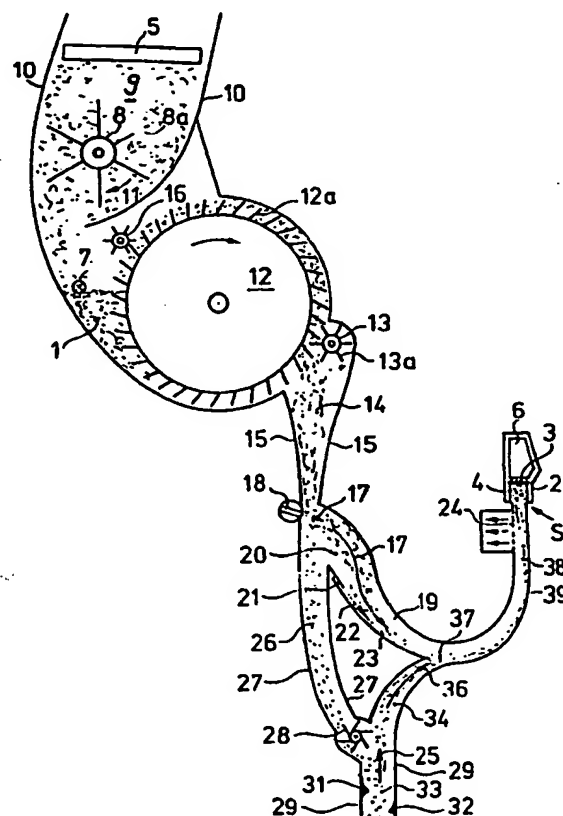
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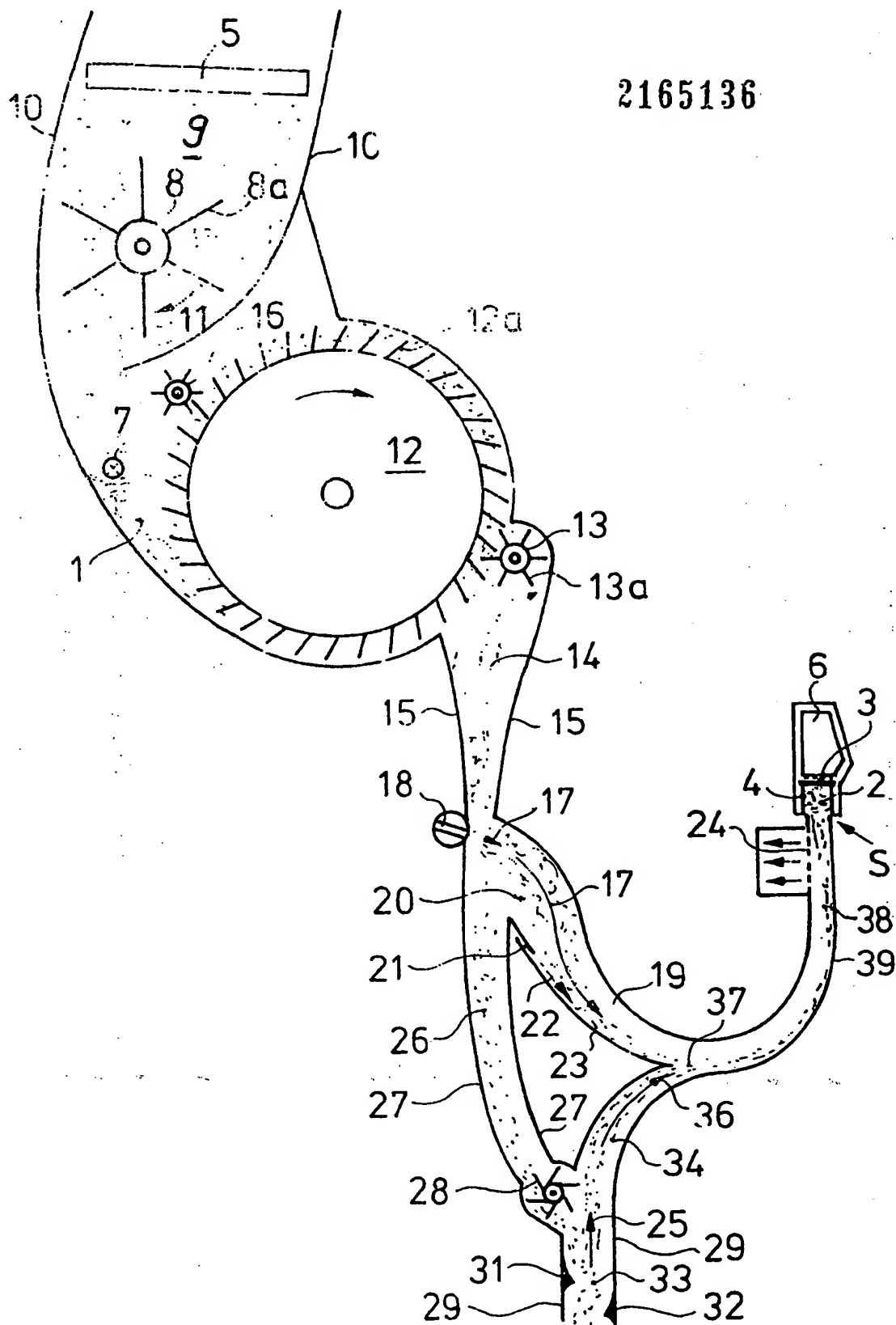
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Manchester M3 3DP(54) Apparatus for the treatment of
tobacco fibres in the distributor of a
cigarette-rod machine

(57) In a distributor for sifting and forming a tobacco rod from a supply, the tobacco is removed from the supply (1) by means of a removal roller (12) and guided by a beater roller (13) preferably vertically downwards directly to a sifting air stream (17) directed at right angles thereto. The light tobacco fibres (20) deflected by the latter advantageously pass by way of a fluidized bed to a rod-forming region (S), to which further light tobacco fibres (34) are separated from the heavier tobacco fibres (33) are also supplied.



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SPECIFICATION

Apparatus for the treatment of tobacco fibres in the distributor of a cigarette rod machine

5 The invention relates to an apparatus for the treatment of tobacco fibres with a removal roller provided with entrainment means for the removal of a layer of tobacco fibres from a supply, with a beater roller for removing the tobacco fibres from the removal roller with separation of the tobacco fibres, with a sifting device using a sifting air stream flowing at right angles to the stream of tobacco fibres, which carries along a first stream of light tobacco fibres (leaf), whereas light and heavier tobacco fibres (ribs) are guided along another path, in which the light tobacco fibres still located between the heavy tobacco fibres are separated, which are then supplied in a second stream to the first stream and combined with the latter and with rod-forming means, to which the combined stream of light tobacco fibres can be supplied.

Apparatus of this type are normally to be found in the distributors of cigarette rod machines. However, the invention is not restricted to the latter, but can also be used in rod machines for the production of cigarillos or cigars and filter rods. In the case mentioned last, the term "tobacco fibres" should be replaced by fibres of filter material. The term tobacco fibres also covers fibres of other smokable material.

It is known from US PS 3 189 034 to beat tobacco fibres by means of a beater roller out of the spikes of a spiked roller, whereupon the tobacco fibres separated in this way are engaged by a fluted accelerator roller and accelerated in the horizontal direction. A sifting air stream flowing at right angles to the fibres separates light and heavy tobacco fibres, the latter still containing a certain proportion of light fibres. In a separate sifting area, heavy and light tobacco fibres are separated from each other and the latter are combined with the main stream of light tobacco fibres. Then the combined streams of light fibres are supplied to rod-forming means and at this point are showered to form a tobacco rod. The known apparatus has the drawback that after being beaten out of the spikes of the spiked roller, the tobacco fibres must once again be accelerated, which involves additional mechanical expenditure, additional space requirement and increased stress.

A beater device for tobacco is known from US PS 3 173 861, which beats the tobacco substantially vertically downwards, yet the tobacco is slowed down intentionally by inclined chutes, until it arrives in the region of a sifting air stream, which separates the heavy and light parts once and finally, which means a poor sifting result. The light tobacco particles are then discharged by way of a series of conveyors arranged one behind the other, which involves additional mechanical expenditure, additional space requirement and stress on the tobacco.

The object of the invention consists of the treatment of tobacco supplied to a machine of the

forementioned type, in which the sensitive fibres are no longer subjected as an absolute necessity to mechanical stress, in which case also the mechanical expenditure and space requirement are kept low with adequate sifting of heavy and light tobacco fibres.

This is achieved according to the invention due to the fact that the sifting air stream acts on the tobacco fibres accelerated by the beater roller and supplied directly thereto. In order to save space, which in cigarette factories is normally available as regards height but not to the same extent in the horizontal direction, it is proposed according to a preferred development of the invention to direct the stream of tobacco fibres accelerated by the beater roller and conveyed to the sifting air stream downwards, preferably substantially in the vortical direction. The sifting air stream deflecting the light tobacco fibres then blows at right angles to the direction in which the tobacco fibres are supplied, in which case the deflected light tobacco fibres are conveyed very advantageously in a fluidized bed produced by an additional air stream along a curved surface. The additional air advantageously has a component in the conveying direction of the tobacco rod. In this case, in a further embodiment of the invention, the space requirement in the horizontal direction can be reduced if the light tobacco fibres are again guided upwards to the rod forming means. In a further embodiment of the invention, the mixture of heavier and heavy as well as some light tobacco fibres not deflected by the sifting air is subjected to further sifting and the light tobacco fibres separated in this way are combined with the first separated stream of light tobacco fibres, before the partial streams of light tobacco fibres reach the rod-forming region. The second stream of light tobacco fibres is advantageously likewise guided upwards, because the sifting air already has this preferred direction.

The object of the invention is achieved in a particularly satisfactory manner due to the fact that following the relatively small tobacco supply is a larger tobacco supply - preferably above it -, from which the small supply is replenished in a controlled manner for example by simple feed means, so that its level is kept at least approximately constant. The large supply can be replenished at intervals by a known, for example pneumatic, automatic supply device, in which case its level may fluctuate.

The invention is described in detail with reference to the drawings:

From a supply 1 of tobacco fibres, amongst which heavier rib fibres are located between a plurality of light leaf fibres, it is intended to remove tobacco and to shower the latter to form a tobacco rod 2 which is as homogeneous as possible, which rod is formed in a rod-forming region S on rod-forming means in the form of an air-permeable conveyor belt 3 at the base of a tobacco duct 4. The tobacco is held on the conveyor belt 3 by intake air, which flows through a perforated base above the conveyor belt 3 into a reduced pressure chamber 6. During the removal of tobacco fibres

from the supply 1 and their conveyance to the rod-forming region S, the undesirable long and heavy tobacco fibres, which may lead to disturbances in the rod, should be separated as completely as possible from the desired light tobacco fibres and discharged.

The tobacco supply 1 is kept at least approximately constant by regulating the level using a light barrier 7. If the supply 1 drops, then in known manner the light barrier 7 controls a feed roller 8 provided with paddles 8a so that it carries out a rotary movement in the direction of arrow 11, by which fresh tobacco from a comparatively large supply 9 in the supply container 10 is supplied to the supply 1 kept approximately constant. The large supply 9 in the supply container 10 is replenished by an automatic, for example pneumatic feed device, as known for example from British PS 1 296 517 and which is therefore shown solely diagrammatically by position 5. In this respect it is also of significance that only one feed device 8 needs to be provided between the large supply 9 and the small supply 1, so that the tobacco supplied by the feed device 5 is only subjected to minimal mechanical stress.

A removal roller 12 (spiked roller) rotating continuously and equipped with spikes 12a removes tobacco fibres continuously from the supply 1 and conveys the latter in a layer between the spikes 12a to a high-speed rotating beater roller 13, whereof the beater spikes 13a beat the tobacco fibres out of the spikes 12a of the spiked roller 12, thus accelerate them and convey them downwards in a stream 14 of separated tobacco fibres. A carding roller 16 combs excess tobacco from the layer of fibres entrained by the spikes 12a, which is consequently made uniform. The stream of fibres 14 accelerated by the beater roller 13 passes through a chute 15 directly, i.e. without the interposition of further conveying means, to the sifting device in the form of a sifting air stream 17 flowing at right angles to the conveying direction of the tobacco fibres 14, which is supplied to the system through an inlet 18. The sifting air stream 17 entrains light tobacco fibres in a first stream 20 in a curved channel 19, to which an additional air stream (arrow 22) is supplied through a further inlet 21, which additional air stream may advantageously have both a component in the direction of arrow 22 as well as in the conveying direction of the conveyor belt 3. The light tobacco fibres are conveyed along the surface 23 of the channel 19, which is first of all curved downwards and then upwards, in the additional air stream 22, i.e. in a so-called fluidized bed, into the rod-forming region S, where the air not flowing through the conveyor belt 3 into the reduced pressure chamber 6 is discharged through a screen 24, from where it passes to the suction side of a fan (not shown), which then once more guides it as blowing air to the inlets 18 and 21. The tobacco fibres not transferred to the channel 19, which form a mixture 26 of light and heavy tobacco fibres, pass into a vertical channel 27 and from there by way of a sealing, rotating bucket wheel lock 28 into a vertical sifting chute 29 with

air guides 31 and 32. In the sifting chute, the mixture 26 is separated by upwardly flowing air (arrow 25), in which case the heavy tobacco fibres 33 drop and are finally removed, whereas the light tobacco fibres are conveyed upwards in a second fibre stream 34 corresponding to arrow 36 and are combined with the first stream 20 at the junction 37.

The combined stream 38 of light tobacco fibres is conveyed in the channel 39 by the upwardly flowing air to the rod-forming region S and showered on the conveyor belt 3 continuously to form a homogeneous tobacco rod 2, which is discharged and processed further in known manner to form a cigarette rod and cigarettes.

The advantage of the aforescribed apparatus consists in that the number of conveying elements and thus the expenditure is kept very small, due to which a saving of space is also achieved. In addition, on account of the small number of conveying members acting on it, the tobacco is treated very carefully, good separation of light and heavy tobacco fibres still being able to be achieved.

CLAIMS

1. Apparatus for the treatment of tobacco fibres with a removal roller provided with entrainment means for removing a layer of tobacco fibres from a supply, with a beater roller for removing the tobacco fibres from the removal roller with separation of the tobacco fibres, with a sifting device using a sifting air stream flowing at right angles to the stream of tobacco fibres, which carries along a first stream of light tobacco fibres (leaf), whereas light and heavier tobacco fibres (ribs) are guided along another path, in which the light tobacco fibres still located between the heavy tobacco fibres are separated, which are then supplied in a second stream to the first stream and combined with the latter and with rod-forming means, to which the combined streams of light tobacco fibres can be supplied, wherein the sifting air stream acts upon the tobacco fibres accelerated by the beater roller and supplied directly thereto.

2. Apparatus according to claim 1, wherein the stream of tobacco fibres accelerated by the beater roller and conveyed to the sifting air stream is directed downwards, preferably in an essentially vertical direction.

3. Apparatus according to claim 1 or 2, wherein the first stream of light tobacco fibres is deflected at right angles to the vertical stream.

4. Apparatus according to any one of the preceding claims, wherein the first stream of light tobacco fibres is guided along a curved surface in the form of a fluidized bed upwards into the rod-forming region.

5. Apparatus according to claim 4, further comprising an inlet for admitting additional air into the channel for light tobacco fibres, in which case the additional air may have a component in the conveying direction of the tobacco rod.

6. Apparatus according to any one of the preceding claims, wherein after separation from the heavy tobacco fibres, the second stream of light

tobacco fibres is likewise guided upwards and combined with the first stream before the rod-forming means.

7. Apparatus according to any one of the preceding claims, wherein preceding the supply of tobacco fibres is a supply which is large in comparison with the former, from which the supply is replenished directly by means of a feed device.

8. Apparatus according to claim 7, wherein the large supply is replenished directly by an automatic supply device for tobacco.

9. Apparatus for the treatment of tobacco fibres substantially as herein described with reference to the accompanying drawings.

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